Claims

1. A method for maintaining a secure tunnel in a packet-based communication system, the method comprising the steps of:
- establishing a secure tunnel between a security gateway and a mobile terminal being located at a first address in a first network, wherein the security gateway connects the first network to a second network and the mobile terminal has a second address that identifies the mobile terminal in the second network;
- in the security gateway, identifying the secure tunnel based on the second address in packets destined for the mobile terminal from the second network;
- detecting a change in the first address of the mobile terminal;
- in response to the detecting step, sending an update message to the security gateway, wherein the update message includes a new address value of the first address; and
- based on the update message, updating the first address associated with the secure tunnel.

2. A method according to claim **1**, wherein the first network is a public packet network and the second network is a private packet network.

3. A method according to claim **1**, wherein the update message is a normal data message to be transmitted to the security gateway when the change is detected.

4. A method according to claim **1**, wherein the sending step includes creating a dummy packet and sending it as the update message to the security gateway.

5. A method according to claim **1**, wherein the sending step includes creating an update message including a NAT-D payload for detecting a network address translation device between the mobile terminal and the security gateway.

6. A mobile terminal for a packet-based communication system, the mobile terminal comprising:
- tunnel establishment means for establishing a secure tunnel to a security gateway through a packet network; wherein the security gateway is

configured to connect a first network to a second network and the mobile terminal has a first address that depends on its current location in the first network and a second address that identifies the mobile terminal in the second network; and

5   - address update means for sending an update message through said secure tunnel to the security gateway when the first address changes, wherein the update message includes a new address value of the first address.

7. A mobile terminal according to claim **6**, wherein the address update means are configured to create a dummy packet if there is no data to be sent

10   through the secure tunnel when the first address changes.

8. A mobile terminal according to claim **6**, wherein the address update means are configured to create an update message including a NAT-D payload for detecting a network address translation device between the mobile terminal and the security gateway.

15   **9.** A security gateway for a packet-based communication system, the security gateway comprising:

        - tunnel establishment means for establishing a secure tunnel to a mobile terminal located at a first address in a first network, wherein the security gateway is configured to connect the first network to a second network and the

20   mobile terminal has a second address that identifies the mobile terminal in the second network;

        - identification means for identifying the secure tunnel based on the second address in a packet originated from the second network and destined for the mobile terminal; and

25   - address update means for updating the first address associated with the secure tunnel, the address update means being responsive to a message received from the mobile terminal, the message including a new value of the first address.

        10. A system for maintaining a secure tunnel in a packet-based

30   communication system, the system comprising:

        - tunnel establishment means for establishing a secure tunnel between a security gateway and a mobile terminal being located at a first address in a first network, wherein the security gateway is configured to connect the first network to a second network and the mobile terminal has a

35   second address that identifies the mobile terminal in the second network;

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- detection means for detecting a change in the first address;

- first address update means, responsive to the detection means, for sending an update message to the security gateway, wherein the update message includes a new address value of the first address;

- in the security gateway, second address update means for updating the first address associated with the secure tunnel in response to the update message; and

- in the security gateway, identification means for identifying the secure tunnel based on the second address in a packet originated from the second network and destined for the mobile terminal.

11. A computer useable medium having computer readable program code embodied therein to enable a mobile terminal to communicate with a security gateway in a packet-based communication system, the computer readable program code comprising:

- computer readable program code for causing the mobile terminal to establish a secure tunnel to a security gateway through a packet network; wherein the security gateway is configured to connect a first network to a second network and the mobile terminal has a first address that depends on its current location in the first network and a second address that identifies the mobile terminal in the second network; and

- computer readable program code for causing the mobile terminal to send an update message through said secure tunnel to the security gateway when the first address changes, wherein the update message includes a new address value of the first address.

12. A computer useable medium having computer readable program code embodied therein to enable a mobile terminal to communicate with a security gateway in a packet-based communication system, the security gateway being configured to connect a first network to a second network, the computer readable program code comprising:

- computer readable program code for causing the mobile terminal to send an update message through a secure tunnel to the security gateway when a first address that depends on the mobile terminal's current location in the first network changes, wherein the update message includes a new address value of the first address.